

No. LXXIX.

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REPORT

TO

THE RIGHT HONOURABLE THE SECRETARY OF STATE FOR THE  
HOME DEPARTMENT

ON THE

CIRCUMSTANCES ATTENDING AN EXPLOSION

Which occurred at the Firework Factory of  
Mr. John Hodsman at Love Lane West, Dublin, on the  
24th May 1887 ;

BY

COLONEL A. FORD,

H.M. INSPECTOR OF EXPLOSIVES.

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Presented to both Houses of Parliament by Command of Her Majesty.

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# REPORT

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The Circumstances attending an Explosion which occurred at  
the Firework Factory of Mr. John Hodsmen at Love Lane  
West, Dublin, on the 24th May 1887;

BY

COLONEL A. FORD,

H.M. INSPECTOR OF EXPLOSIVES.

Sir,

Home Office, 19th July 1887.

I HAVE the honour to report that in obedience to your Order of the 4th instant,\* made under the 68th section of the Explosives Act, 1875 (38 Vict. c. 17), I have held an Inquiry into the circumstances attending an explosion which occurred at the Firework Factory of Mr. John Hodsmen, at Love Lane West, Dublin, on the 24th May 1887, by which two persons, viz. Henry Hanscomb, aged 50, and Mary Ann Ward, aged 13, were seriously injured. Mary Ann Ward died in the Meath infirmary on the 10th June. At the date of this Report Hanscomb was still in the infirmary, but in a fair way towards recovery.

In accordance with the provisions of the above-mentioned section of the Act, I beg to render the following Report.

The Factory in which the accident happened is situated at the back of Love Lane West, on the south side of the city of Dublin. It existed prior to the passing of the Explosives Act, 1875, for several years without any license, but on the 13th December 1873, an informal license was granted for the place by the justices of the City under the Gunpowder Act of 1860, and it was re-licensed under the present Act on the 25th July 1877.

Mr. Hodsmen's factory.

The land in this part of the city is not very closely built upon. The buildings of the factory are placed at suitable distances from one another, the amount of explosive allowed in each being also fixed with reference to the surroundings, so that in the event of an explosion happening, no structural damage of any importance may accrue to buildings and works outside the factory.

The explosion occurred about 11 a.m. on the 24th May in the building No. 6 on the plan of the factory, in which the following operations of manufacture are allowed by the license to be carried on:

Building in which the explosion occurred.

Distinguishing number, letter, or name of building, room, or place on plan attached to License	Application of building, room, or place, or process to be carried on therein.	Explosive allowed or ingredients or articles liable to spontaneous ignition, or inflammable, or otherwise dangerous, and limitation of quantity to be in each building, room, or place.	Limitation of number of workpeople to be in each building, room, or place.
6	(a) Making coloured fires and stars; or (b) finishing manufactured fireworks; provided that the operations (a) and (b) shall not be carried on at one and the same time.	(a) Coloured fires and stars, 25 lbs.; ingredients for the same, no more than is necessary for the supply and work of the building; or (b) manufactured fireworks, wholly or partly finished, 60 lbs.	2

\* H.O. Papers, 51,477.

The building was of brick (one brick thick), with a slated roof, about 14 feet by 12 feet externally, and was lined throughout with wood. There was a door opening outwards in the north-west side, and a bench or table ran round the three other sides. There were two windows in the side facing the south-west.

On the day of the explosion Henry Hanscomb was engaged in the building with Mary Ann Ward in finishing crackers. Hanscomb was making fireworks on his own account, having been allowed to use certain buildings in the factory by Mr. Hodman when they were not required by himself for the purpose of his own manufacture. Ward was employed by Hanscomb, and was paid by him.

Manufacture  
of crackers.

In the manufacture of crackers a "milling" machine is employed to flatten the paper tubes which contain the gunpowder. That in use in Mr. Hodman's factory was about 10 inches high, and consisted of two revolving cylinders of iron, each about three inches in diameter, set in an iron frame, the lower cylinder being fixed, while the upper was free to move in a vertical slot. The distance between the cylinders was adjusted by means of a screw at the top of the machine, the screw being in contact with the centre of a spring, the ends of which pressed down the axis of the upper cylinder. The lower cylinder was made to revolve by a handle. The machine was attached by screws to a wooden bottom, which in turn was screwed to the bench.

The details of the manufacture as carried on in this factory are as follows: Cylindrical paper tubes of the required length and diameter having been previously prepared, before being filled they are flattened in the milling machine. One end is then doubled up and gunpowder is poured in at the end through a funnel. Mr. Hodman estimates that a quarter barrel of gunpowder (25 lbs.) will fill about 34 gross of penny crackers, or about 44 gross of halfpenny crackers. The operation of filling is carried on in a separate building, the object being to exclude the workpeople engaged in finishing from the risk which necessarily attends the presence of a large quantity of gunpowder. In the finishing process no loose gunpowder is required, only the few loose grains which may fall from the filled crackers being present in the building.

The tubes when filled are brought to building No. 6 to be finished. In this process they are twice passed through the milling machine, the cylinders being set closer together for the second milling. They are then placed for a short time between damp cloths to enable them to undergo the operation of bending, which is effected by means of wires about which the flattened tubes are twisted. The open ends are then closed with small pieces of touch paper, and the crackers are finally tied with hemp. All the operations subsequent to filling are included in the process of finishing.

Circum-  
stances of  
explosion.

At the time when the explosion occurred, Hanscomb was standing at the bench inside the windows engaged in milling filled tubes to form penny crackers, while Ward was sitting on his left-hand side occupied in tying some halfpenny crackers which had been previously bent. As far as I could ascertain, there were altogether about 18 gross of penny crackers, and eight gross of halfpenny crackers in different stages of manufacture in the building. This was not an excessive quantity. The milling machine, which, as before stated, was attached to the bench by screws, had worked loose owing to the wooden bottom being cracked, and Hanscomb had removed one of the screws and was making a hole for it with a gimlet. The gimlet, however, was defective at the point and would not "bite" into the wood of the bench. Thereupon Hanscomb took up some implement ready to hand and proceeded to drive in the gimlet by striking it upon the head. An explosion ensued, and all the crackers in the building were at once ignited. The clothes of Hanscomb and Ward were set on fire before they could escape, and the woodwork of the building was also set on fire and burnt fiercely.

Mr. Hodman who was in his house about 50 yards off heard the sound of the explosion, and supposing that it was the report of a field gun fired in Phoenix Park, (distant about a mile) did not go at once to the building; but on learning what had occurred, he had the injured attended to as quickly as possible. The fire was put out with huckets of water before the floor of the building and the bench were burnt through.

Cause of  
explosion.

It is not clear what particular implement Hanscomb used to strike the gimlet. He appears to have told Mr. Hodman and those who assisted in removing his burning clothes that he employed an iron spanner (found under the bench in the building after the fire had been extinguished) for the purpose, while he stated to me twice in the infirmary that he was knocking the gimlet in with a wooden hand brush which

was kept in the shed. A small portion of this brush was found in the shed unconsumed by the fire. Mary Ann Ward on the other hand told me that he was using a wooden mallet. Hanscomb explained with regard to the presence of the spanner in the building that he had previously used it instead of a screw driver to remove the screw which had worked loose, though how he employed it for this purpose was not very evident. I am disposed to believe that he was really attempting to knock in the screw driver with the hand brush, and that, as there was doubtless coloured fire composition upon it, owing to the building being also used for making coloured fires and stars as an alternative process, some of this coloured fire fell from the brush upon the handle of the gimlet. Coloured fires are generally more sensitive to percussion and friction than ordinary gunpowder, and would readily be ignited by a blow with a brush upon the wooden handle of the gimlet, or still more readily upon the metal of the gimlet which passed through the handle. But whatever may have been the implement which Hanscomb was using, the blow with this implement upon the gimlet without doubt brought about the explosion.

This accident, if it can be so called, was thus entirely due to Hanscomb's recklessness, in striking the gimlet on the head in order to drive it into the bench. Whether he employed a brush, or a mallet, or an iron spanner for the purpose is of no very great importance, as it only affects the degree of recklessness, which, in either case was sufficient to bring about an explosion. The handle of the gimlet appears to have been broken off by the force of the blow, as none of it remained when the gimlet was found still in the bench, after the fire has been extinguished.

As to blame to be attached.

There is a provision in Section 23 (as applied by Section 39) of the Explosives Act, 1875, which requires that the occupier of every factory for explosives, and every person employed in or about the same, shall take all due precautions for the prevention of accidents by fire or explosions in the same, and shall abstain from any act whatever which tends to cause fire or explosion, and is not reasonably necessary for the purpose of the work in the factory. This provision Hanscomb was, of course, evading.

He was also directly contravening one of the general rules of the Order in Council, No. 2, which apply to the Factory. General Rule 5 provides that before repairs are done to or in any room or other part of a danger building, that room or part shall so far as practicable, be cleaned by the removal of all explosives, and wholly or partly mixed ingredients thereof, and by the thorough washing of such room or part. Had this General Rule been observed before Hanscomb proceeded to carry out the repair to the machine, no accident would have happened.

Hanscomb is thus, in my opinion, directly responsible for the loss of Mary Ann Ward's life, and for the injuries which he himself has sustained.

Mr. Hodsman, the occupier of the factory, is liable to a penalty not exceeding ten pounds for each of the above breaches of the Act committed by Hanscomb in his factory.

Another non-observance of the General Rules was brought to light by this explosion. General Rule 11, provides that a person under the age of 16 years shall not be employed in or enter any danger building except in the presence and under the supervision of some grown-up person. When Colonel Majendie inspected the factory on the 3rd May last, he found Mary Ann Ward working alone in the building in which the present accident subsequently happened, and in response to his inquiries, she informed him that she was over 16 years of age.

I ascertained that she had also been working for a time alone in the same building on the morning of the accident. Mr. Hodsman is liable to a similar penalty (ten pounds) for each of these breaches.

It is thus evident, that as regards the observance of the regulations, this factory is not on a proper footing. We have several times had cause to complain of Mr. Hodsman's want of attention to them, and on two previous occasions we have found it necessary to institute proceedings against him for breaches of the Act.

By the terms of Mr. Hodsman's license, the workpeople when employed in the danger buildings of the factory, are required to wear outer clothing "of woollen or other nonflammable material." As both Hanscomb and Ward received severe burns about the body, I thought it desirable to inquire how far the so-called unflammable clothing supplied by Mr. Hodsman to his workpeople was really unflammable, and submitted a portion of that taken off Hanscomb to Dr. Dupré, F.R.S. for examination. Dr. Dupré reports as follows:—

"The unflammable clothing is made of wool and cotton; what, I believe, is called the woof, is cotton, the warp is wool.

"The material sent is certainly not inflammable in the ordinary sense of the word, but it would no doubt be better if it were made entirely of wool. There is a good deal of powder residue, and also much oxide of iron, and a little oxide of tin; the two latter substances no doubt used in dyeing the wool and cotton, but there is not so far as I can make out, any attempt made to render the clothing unflammable by chemical means, but reliance is probably placed on the wool.

"The chief danger, I suppose, is the fact that the clothing becomes impregnated, or covered with gunpowder, which of course will take fire whatever the kind of clothing may be, and through this the underclothing may take fire. I believe, however, that the danger of this would be materially lessened if the clothing were entirely of wool and of a closer texture and with a smoother surface, so that powder dust could not so readily cling to and penetrate it."

It appears, therefore, that there was room for considerable improvement in the matter of this clothing also.

It is very desirable that a building in which coloured fires and coloured stars are made shall be devoted exclusively to that part of the manufacture. It is in fact very difficult to ensure that all traces of coloured fire composition are removed from the building before it is appropriated to another purpose, and owing to the sensitiveness of coloured fires, an extra risk is thus liable to be introduced into the building. This plan of devoting a separate building is adopted almost universally in the trade, and in small firework factories is imposed by the regulations in the Order in Council.\* Mr. Hodsman has expressed his readiness to re-arrange the appropriation of the buildings in his factory with this object in view.

Coroner's  
inquest.

As before stated, Mary Ann Ward died on the 10th June. An inquest on the body was held by Dr. N. C. Whyte, the Coroner for the city of Dublin on the 13th June, but it was not adjourned for the attendance of a Government Inspector, as required by section 65 of the Explosives Act. I was not in fact aware that she had died until after the inquest had taken place.

The coroner has since been called upon to explain this omission. He has stated that he "totally forgot" that it was his duty to send notice. He at the same time furnished copies of the depositions and the finding of the jury.

The only evidence taken was (1) that of Thomas Ward, who deposed that the deceased was his daughter, and was 14 years of age; (2) that of Mr. John Hodsman, who deposed as follows:—"I am a firework manufacturer. The deceased and Henry James Hanscombe were making crackers, and Hanscombe was trying to steady a frame of the rolling mill that flattens the crackers, and was screwing a gimlet when he unfortunately struck the top of it with an iron bolt-wrench; a spark flew and caught the crackers. An explosion took place and both were badly injured. They were taken to hospital. The spanner or wrench was there without my knowledge or authority. The rolling mill of which I produce the charred fragments was the one in use"; and (3) that of a pupil in the Meath Infirmary, who deposed that the deceased died on the 10th June in consequence of injuries caused by an explosion of gunpowder. The verdict of the jury upon this evidence was: "We find that the said Mary Ann Ward died in the Meath Hospital on the 10th June 1887 in consequence of injuries received in an explosion of fireworks which took place accidentally at Mr. Hodsman's, Love Lane, on the 24th May 1887, and we say that the accident was caused by a defect in the machinery."

As to this inquest, there can, I think, be only one opinion. It was little more than a farce. In the first place the only evidence as to the circumstances of the accident was that of Mr. John Hodsman, who was not present at the time. In the second place the jury on this evidence arrived at a conclusion that the accident was caused by a defect in the machinery, which was not the case. The accident was brought about by an attempt to repair a defect in the machinery in an improper manner. Dr. Whyte in his explanation as to why he did not report the matter and adjourn the inquest, states: "The evidence available at the inquest was exceedingly meagre. The only persons in the building where the explosion took place were the deceased and a man named Hanscomb, who was himself badly injured and incapable of giving

\* See Order in Council, No. 4, Part III., General Rule 18. (3).

"evidence." In my opinion this circumstance alone pointed to the necessity of an adjournment of the inquest, apart from the obligation arising under the Explosives Act for the attendance of a Government Inspector. As the negligence of the coroner has been called attention to elsewhere, it is not, I conceive, necessary for me to say more on this subject.

I have, &c.,  
A. FORD,  
Colonel,  
H.M. Inspector of Explosives.

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